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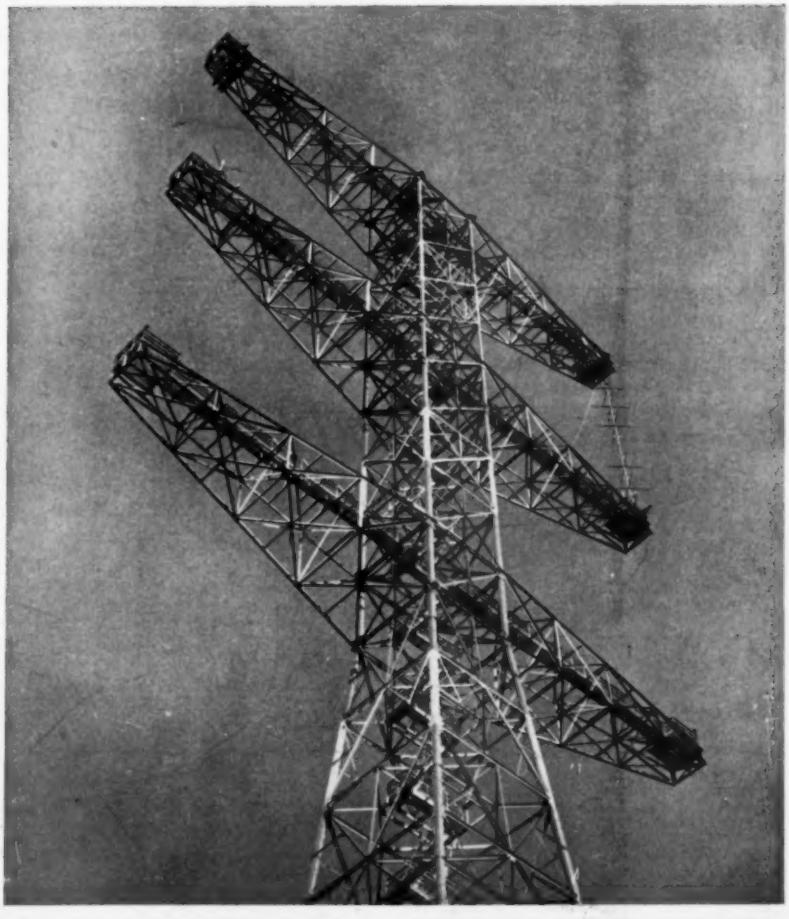
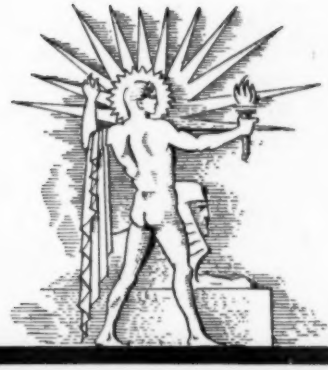
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





June 10, 1939

## Frequency Modulation Antenna

See Page 355

A SCIENCE SERVICE PUBLICATION

# *Do You Know?*

Manufacturers say that dark colored paint usually weighs less than light colored paint.

East Timbalier Island in the Gulf of Mexico has moved more than two miles in a hundred years.

Terrible Mouse—in Greek, *Dinomys*—is the name of a rare rodent with big teeth, found in Peru.

A flock of goats on Long Island supplies New Yorkers with a thousand bottled pints of milk daily.

Studies of college girls indicate few of them get as much vitamin C daily as is contained in a large glass of orange juice.

Race horses travel about 55 feet a second, and to photograph their position at the finish requires exposure speed of 1/500 of a second.

The Russian geographer Shokalsky is honored by having named after him an island, a strait, two glaciers, a peak, and several other geographic features.

A curtain material made of a new secret compound, mainly rubber, is said to resist sunlight and to be more flame resistant than most curtain goods.

Bird casualties on the highway are attributed mainly to cars traveling over 35 or 40 miles an hour, and one observer thinks the draft from the fan may partly hinder the birds from escaping high-speed traffic.

## QUESTIONS DISCUSSED IN THIS ISSUE

*Most articles which appear in* SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

**AERONAUTICS**

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**INVENTION**

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Why should old people take their vacations in winter? p. 362.

**RADIO**

What new development will banish static from home radio reception? p. 355.

**TECHNOLOGY**

How can holes in rubber be made to hold their shape? p. 358.

Uses for rubber in the movies include trees and foliage for hurricane scenes and waterproof "hair" for diving girls.

Among the small-flowered hardy chrysanthemums bred by the U. S. Department of Agriculture, 12 seedlings have been introduced to the trade.

Cornell dietitians say that a potato can better be compared to an orange than to white bread or macaroni, because oranges and potatoes both contain calcium, phosphorus, iron, carbohydrate and vitamins A, B and C.

The English channel has been crossed by a pilot flying a glider.

The seahorse uses its long tail to hitch itself to seaweed or coral.

European royalties of the Middle Ages considered falcons from Greenland especially fine for hunting.

The most ferocious and bloodthirsty mammal is the tiny least weasel, which kills even when not hungry for the lust of killing.


# SCIENCE NEWS LETTER

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RADIO

# Science Tunes In a New Kind Of Static-Free Radio Service

## "Frequency Modulation" Using Ultra Short Waves Threatens to Make Obsolete Present Stations and Sets

**See Front Cover**

AN ENTIRELY new kind of radio is being tuned to the American public. It promises to bring high fidelity, noise- and static-free programs of startlingly realistic quality when compared with conventional broadcasting. It is called "frequency modulation."

Maj. Edwin H. Armstrong, veteran pioneer in radio, inventor of regenerative, superheterodyne and super-regenerative radio circuits, is the impresario engineer who has created and produced this potentially revolutionary broadcasting development using ultra-high-frequency.

It has come out of the laboratory. It is spraying its novel ether waves from a powerful transmitter atop the Jersey Palisades opposite Manhattan, and soon it will come from the summits of lofty Mt. Washington, N. H., and Mt. Ashnebumskit, near Worcester, Mass.

As it threatens to make obsolete broadcasting stations and receiving sets now in use, this frequency modulation radio has opened vast possibilities for the future. Because it uses ultra-short waves, it makes possible an almost unlimited number of broadcasting channels, providing room for nationwide chains and local stations galore. Because it covers the normal broadcasting operating area of a locality with less power than conventional stations, it promises to bring cheaper station operation and consequently more opportunity for local stations.

### No Interference

Yet one of the characteristics of frequency modulation is that two stations using the same radio channel do not interfere with whistles and squeals, because either one or the other, not both, is received.

High places, like skyscrapers, mountain tops, and monuments will take on added usefulness because they will be needed as locations for the unusual transmitting antennae, shaped like multiple T's, one of which is pictured by Roy L. Pepperburg on the front cover of this week's SCIENCE NEWS LETTER. The ultra-high frequencies used behave better within the line-of-sight range of the transmitter, although they do have greater range and lack the reflection difficulties being experienced with television.

New radio sets will be needed. The conventional sort will not receive frequency modulated signals. But the new sets will be cheaper to build, and during a transition period, while both kinds of radio are filling the ether, sets capable of receiving both kinds of radio will be in vogue. A flick of a switch will allow the frequency modulation receiver to receive the ordinary sort of signal now broadcast. Two large makers of sets will have such sets on the market this summer or early fall.

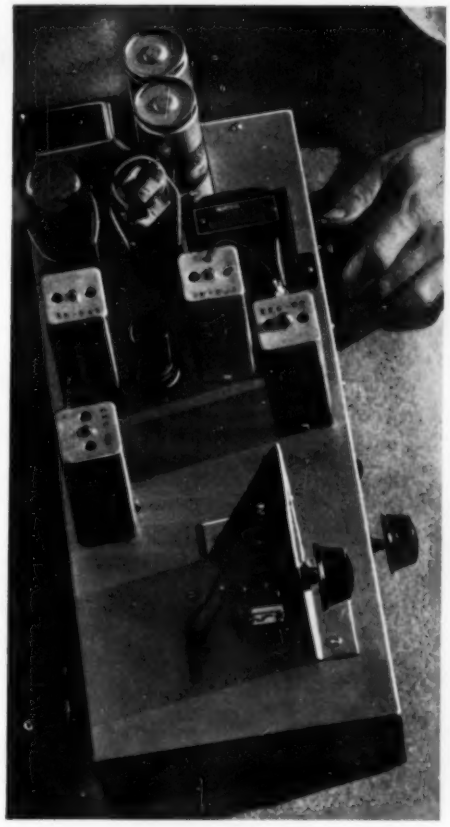
If anyone other than Major Armstrong had invented and pushed to realization this new kind of radio, there might have been no system ready to go into the home of listeners today. Major Armstrong is the happy combination of a first-rate scientist-engineer and a keen-minded business man who can put over an idea once it is developed.

### Ten-Year Research

As a protege of Columbia University's Prof. Michael I. Pupin, Major Armstrong worked for ten long years attempting to get rid of static by various means. Not until he utilized frequency modulation, and, despite discouragement from other trials, made it work, did he succeed in conquering static.

An amateur radio station on Long Island, W2AG, operated by C. R. Runyon, played an important part in demonstrating the practicality and superiority of frequency modulation radio. On its 100-foot tower the unconventional antenna used for frequency modulation was erected. Test programs were broadcast. The experts came, listened, and their skepticism disappeared.

These pioneer tests convinced officials of the Yankee Network in New England that they should adopt the new radio method to supplement their regular broadcasting. Radio transmitters of a new kind began to grow on mountain tops. The success of the W2AG tests paved the way for a frequency modulation transmitter with sufficient power to serve the New York area.



*COMPACT*

***This little six-tube radio receiver was designed by Major Armstrong for reception on his frequency modulated system which operates on ultra high frequencies and is free of static.***

At Alpine, N. J., eight miles north of George Washington bridge, the 400-foot tower of W2XMN, a 40-kilowatt station, has arisen. Its performance convinced more experts of the value of the new kind of radio. But it was only after convincing the Federal Communications Commission that he could erect this $250,000 transmitter with his own money that Major Armstrong was permitted to go ahead.

Even after the system was developed the difficulties were not all removed, for tremendous commercial investments are tied up in present-day radio equipment.

Operating on ultra-short radio waves the frequency modulated signals travel distances only two or three times beyond the distance of the horizon and have a service area over a circle of about 100 miles radius.

While this short range might once have been a handicap, the present use of

***INVENTOR***

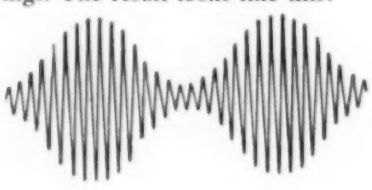
***Columbia University's Professor of Electrical Engineering, Maj. Edwin H. Armstrong, is the inventor of the frequency modulation method of radio communication. Its remarkably clear service range is about 100 miles radius from the transmitting station.***

network broadcasting has minimized the demands for distance reception. Most people prefer to tune in their local station and get the better network program. Frequently, if they switch to distance, they find that they are getting the same chain program anyway.

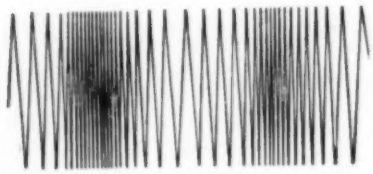
When a station covers a 100-mile zone about the large centers of population in the cities it is serving nearly all of the American listening public.

The new radio system rides through natural and man-made static with ease. How it does it is not as difficult to understand as the name, frequency modulation, might indicate.

Ordinary broadcasting uses amplitude modulation which means that the alternating current signals have little wiggles on them which become speech in your loud speaker. The modulation is obtained by changing the size of the swings of the AC signals. Loud sounds mean large swings and soft sounds small swings. The result looks like this:



In frequency modulation all the swings of the waves are the same and modulation is obtained by varying the frequency. Intense, loud sounds have much higher frequency than soft sounds. The wave pattern looks like this:



One way of saying it is that the speech sounds caught by the microphone make the frequency wander rapidly over the dial. With this system the receiver has the ability to pick up the station at nearly any point on the dial.

Noises of static are found to be alternating current signals having very small frequency variations but large amplitude swings.

Ordinary broadcasting keeps the transmitter's frequency as stable as possible and hopes that the frequency of static noise will miss it or, if the two happen to coincide, overpower it.

In the new Armstrong system, however, all signals have the same amplitude and by making the receiver sensitive only to shifts in frequency the interference with noise is small. Wide frequency swings in the signal make it powerful relative to noise.

The signal-to-noise ratio is predominantly in favor of frequency modulation. It is equivalent to boosting the power of ordinary amplitude modulated stations some hundreds of times.

As to the future of frequency modulation radio, C. A. Priest, editorializing in *General Electric Review*, says:

"The need for additional facilities in the present broadcast band—which cannot readily be accomplished technically—makes it probable that an additional band in the ultrahigh-frequency range will eventually be allocated to supplement present services and to provide for new services which cannot be accommodated in the present band. For these services the advantages of frequency modulation clearly render it the logical, technical, and economic choice; in fact it seems clear that practically every service requiring voice transmission by radio at frequencies above 30,000 kilocycles can be performed best by frequency modulation."

To the potential purchaser of a new type receiver for such radio service the operation of the device may be interesting but, in final analysis, he wishes to know what this new kind of radio can do which ordinary radio cannot. What does it sound like?

Outstanding is the remarkable clarity of tone in music and amazing reproduction of sounds including the human voice. Add the virtually complete suppression of static and inner-set noises and you have a picture of this superior reception. Strange indeed will seem the absolute silence of the receiver when a speaker pauses between sentences or an orchestra halts for an instant in its program. The receiver seems turned off rather than merely quieted.

Faint musical passages in a beautiful melody—now frequently lost because they have insufficient volume to ride over noises—come through with brilliance that brings new conceptions of what radio should be like.

In contrast, the tremendous crescendo passages of a Wagnerian opera—whose intensity sometimes overloads present radio transmitters and is perhaps cut off in the control room at the broadcasting stations—are enabled to come into the receiver in every home.

Homely natural sounds like the scratching of a match and the gurgling of water from the mouth of a bottle are transmitted with absolute fidelity, not by a sound effects man simulating the sounds in a studio but by broadcasting actual sounds.

One British journalist after hearing the reception went back home and told his readers the reproduction was "ghastly" in its reality. He looked for the gurgling water to run out of the loudspeaker and the scratching of a match to burn his hand.

*Science News Letter, June 10, 1939*

MEDICINE

## Nicotinic Acid Clears Up Outbreak in Herd of Pigs

NICOTINIC acid, responsible for dramatic cures in desperate cases of human pellagra, has been used with striking effect to clear up an apparently similar disease in a herd of pigs at Pennsylvania State College.

The swine had been failing to gain in weight and had diarrhea and a bad scurf on their skins, when the nicotinic acid treatment was tried. They were restored to normal condition in six weeks.

The success of the treatment is reported (*Science*, May 26) by Drs. L. C. Madison, R. C. Miller and T. B. Keith.

*Science News Letter, June 10, 1939*

MEDICINE

# Finds Sulfapyridine Speeds Recovery from Gonorrhea

## Apparent Cures in From One to Eight Days Reported; No Failures in Group of 18 Acute and Chronic Cases

APPARENT cures of gonorrhea in from one to eight days by the new chemical remedy, sulfapyridine, have led physicians of the Mayo Clinic to advise use of this remedy in treatment of the condition. Sulfanilamide has previously been used successfully to treat this disease but sulfapyridine may prove even more effective.

In their group of 18 cases there were no failures and few untoward reactions Drs. E. N. Cook and E. B. Sutton reported at a recent Mayo Clinic staff meeting. In two cases symptoms continued for as long as nine and 14 days respectively, but in all cases negative cultures, showing absence of the germs, were obtained within from one to eight days. Both acute and chronic cases recovered under this treatment, but the physicians point out not enough time has elapsed since the treatment to be sure that there will be no relapses.

A much smaller dose of sulfapyridine than required in treatment of pneumonia is effective in gonorrhea. The chemical seems to be most effective when combined with "mild local treatment." The mildness of the reactions to the drug among their patients is due, the physicians believe, to the fact that it was given in a small quantity of milk, which relieves the stomach and intestinal distress so often caused by sulfapyridine.

The advice to treat gonorrhea with sulfapyridine is based both on experiences at the Mayo Clinic and on cases reported by physicians elsewhere "in which the same phenomenal results and few relapses have been noted."

*Science News Letter, June 10, 1939*

AERONAUTICS

# All Landings Blind When Necessary, Experts Forecast

ALL LANDINGS blind, if need be. Airlines, come fog or high water, virtually as regular as the railroad. This airman's dream will gradually sneak into reality during the next three years, government radio experts predicted and promised as blind landing studies begin in a newly dedicated laboratory of the Civil Aeronautics Authority at Indianapolis.

Minimum ceiling requirements—now 300 feet at the best airports and higher elsewhere—will be lowered a hundred feet at a time as pilots become skilled in the use of landing instruments and as equipment is more widely installed, they said. The first thing you know, paying passengers will be making regular trips in safety in almost all kinds of weather. A development that has been promised for "next year" for many years now will actually be accomplished.

The engineers foresee early adoption of a standard and practically foolproof instrument landing system by the airlines and the Civil Aeronautics Authority on the basis of three months of intensive study to be started by the C.A.A. and the lines during the next few days.

In Indianapolis to dedicate the Authority's first field station, they declared training in earnest of the hundreds of airline pilots in how to come down out of the sky on a radio highway will begin this summer.

Ten airports throughout the United States will soon be equipped with blind landing apparatus similar to that at the new field station, said to be the most complete. The airports are to be chosen so as to encounter the widest possible variety of conditions and afford training facilities to the maximum number of pilots. The new C.A.A. unit is the only one involving four sets of equipment to allow landings in whatever direction the wind requires.

This system, worked out by the Radio Technical Committee for Aeronautics and the airlines, and built by the International Telephone Development Corporation, will be adopted as standard with but slight modifications.

### Both Sight and Sound

Differing somewhat from previous systems, it gives the pilot both sight and sound indications of when he is near the airport and when he is passing over its edge. The glide path is formed by the intersection of two planes of radio signals. A vertical plane is generated by a localizer beam similar to the radio range in regular use. It tells the pilot whether he is to the right or left of his course. A second transmitter sends out its signals from a point 400 feet to the side of the end of the runway, in a plane slanting upwards. The pilot can slide down any part of this plane and reach the ground, but he slides down the particular path marked by the vertical plane of signals. He can come in all the way by radio or guide himself by the marker lights once he reaches the field, for he is then but 60 to 80 feet up.

*Science News Letter, June 10, 1939*

PHYSIOLOGY

# Alcohol in Blood Limit Is Suggested Traffic Law

"IT SHALL be conclusive evidence that a person is under the influence of intoxicating liquor sufficiently to affect his ability to drive safely if it is shown by chemical analysis that within one-half hour after he has ceased operating a motor vehicle his blood contains one-half milligram, or more, of alcohol per cubic centimeter."

This is a new traffic regulation recommended by Dr. Yandell Henderson, Yale's emeritus professor of physiology, the father of 3.2% beer, and a proponent of moderation in the use of alcohol.

Just how valid are various proposed methods of analyzing for alcohol the blood or breath, Prof. Henderson would leave to the courts and their competent scientific advisers.

Analysis of the exhaled air is one method proposed, based upon the fact that when alcohol is in the blood a definite proportion of it diffuses into the air in the depths of the lungs. The breath can be collected by having the suspected person blow up a rubber bag. But Prof. Henderson considers this method unperfected and likely to give misleading results.

European investigations and confirming American tests show that the mod-

erate drinker, who has less than that half milligram of alcohol per cubic centimeter of blood, has no more accidents than the wholly non-alcoholic motorists. This is comforting to those who have worried about the possibility that for safety's sake they would have to give up either motor cars or alcohol.

Scientists recognize that alcohol does affect different persons to different degrees. Should traffic regulations take account of these differences? Prof. Henderson comments that there are also marked differences even among entirely sober persons in the ability to drive a car. Yet there is a 25-mile-an-hour speed limit for all.

What does half a milligram of alcohol per cubic centimeter of blood mean practically? Yale tests show that on an empty stomach 2 ounces of whiskey, such as a highball, somewhat less of gin, as in a Martini, or 1 to 1½ quarts of beer can be taken without exceeding the suggested limit. With or soon after a meal, double these quantities can be taken safely. Keep well within these limits for safe driving, is Prof. Henderson's advice.

*Science News Letter, June 10, 1939*

TECHNOLOGY

## Scientists Make Tiny Holes in Rubber Sheeting

EVER since Charles Goodyear dropped sulfur and crude rubber on a hot stove top a hundred years ago and learned how to vulcanize rubber the industry has been trying to increase the air-tight, water-tight and liquid-tight properties of its product.

Recently, however, the attention of scientists at the U. S. Rubber Company has been turned in the reverse direction. They have been trying to make rubber with holes in it, but holes that have controlled size and spacing with the emphasis on extreme smallness of size.

The objective is to produce a thin rubber filtering membrane which will find wide utility in scientific research. For immediate commercial use the "holey" rubber is finding use in rubber bathing suits and in girdles.

No punching method can produce the holes in rubber desired, for they are so tiny that 6,400 of them are encompassed in a square inch of surface in the extreme case.

Trick of the operation, according to *Business Week*, is a continuous rubber belt whose upper surface is covered with microscopic pits or depressions. As rubber latex is spread over this surface it entraps a small air bubble over each depression. Heat applied to the under surface of the belt expands the air and swells each bubble until it bursts, leaving a uniform hole.

A drying and cooling chamber makes these holes set permanently into the rubber sheeting. By running this same sheet through the device a number of times thicknesses of from five-thousandths to a tenth of an inch can be created. Maximum width of the sheets is now 42 inches and the maximum length 18 yards.

If the sheets are stretched before vulcanizing it is possible to create oval holes or even slots. The process is applicable either to ordinary stretchy rubber or to hard rubber; the latter a field which interests industrial research as a filtering medium.

*Science News Letter, June 10, 1939*

CHEMISTRY

# Bulk of Important Chemicals Made from Few Minerals

### Water, Air, Coal, Sulfur, Mineral Salt, Limestone, Sulfide Ores, Brines, Petroleum and Gas Are First 10

THAT the chemical industries depend on mineral resources for their raw materials is well known, but it is little realized that the great bulk of the most important chemicals are made from a relatively few minerals.

Give a chemist water, air, coal, sulfur, mineral salt, limestone, sulfide ores, brines, petroleum and natural gas and he can make an amazing host of basic and important chemical materials. This list, in fact, represents the "first ten" of the raw material resources of chemistry according to a new survey reported in the current issue of Economic Geology by Prof. T. T. Quirke and R. N. Keller of the University of Illinois.

Out of a total list of only 34 mineral sources chemistry can fashion literally thousands of chemicals and, most important, a basic list of 150 bulk chemicals, such as ammonia, glycerine, carbon, chlorine, aniline and so on.

In making the basic 150 important bulk chemical products, it was found by the Illinois study that water, air and coal were needed most frequently. Thus water had a relative frequency of use given by an index number 99. Air followed with an index number 96 and coal was a close third with a rating of 91.

The element sulfur came next with a rating of 88 and the first "ten" ended with natural gas having index number of 16. The remaining 24 mineral sources on the basic list of 34 begins with saltpeter (index 13) and ends with titanium ores of rating 1.

A point brought out sharply by this new study in economic geology is the highly developed inter-dependence of all branches of chemical industry. This results, state the scientists, in a vertical type of industrial development which includes the basic mining industries.

There is a definite trend in the industry for individual companies to control virtually all stages in the preparation of chemicals from the owning of the mineral resources to the marketing of the final product.

*Science News Letter, June 10, 1939*

PHYSIOLOGY

## New Standards for Taking Blood Pressure Readings

A MOVEMENT for better blood pressure readings is under way. It was started a year and a half ago by a joint committee of the American Heart Association and the Cardiac Society of Great Britain and Ireland. It has significance for millions of people.

The movement aims at standardization of blood pressure readings, so that in future your physician will take and record your blood pressure exactly the same way that every other physician in an English-speaking country takes blood pressure readings. At present there is considerable variation in the way different doctors do this.

For example, when an amplifying arrangement was set up so that a group of physicians could all listen at the same time for the same patient's pulse there was a variation of as much as 20 to 30 points in the blood pressure readings for this patient.

This variation may affect the treatment you are given. Suppose your doctor decides to give you a remedy which an-

other doctor has found successful for patients with your blood pressure. But suppose the other doctor's method of taking blood pressures gives readings 20 to 30 points higher or lower than the method your doctor uses. You can see the confusion that may result, especially since your doctor has no way of knowing how the other doctor takes blood pressure readings.

The joint committee found that a large proportion of medical schools did not know how their students were being taught to take blood pressure readings and many did not agree on how this should be taught. Neither did 100 insurance companies know how their medical examiners were recording blood pressure readings. One examiner might reject for insurance a man who would be passed by another examiner.

Besides lessening confusion over blood pressure readings, the new standard method recommended by the joint committee may call attention to heart ailments now being overlooked and may result in discovery of new facts about blood pressure.

*Science News Letter, June 10, 1939*

PHYSICS

# Light Weight Mesotrons Have A Longer Life

## Those With Mass 200 Times That of Electron Are Found To Disintegrate 200 Times as Quickly

IF HUMAN life behaved like the newly discovered mesotron particles of atomic physics one could set up a rule which would read, "If you're light you'll live longer."

The "father" of the mesotron particles —the first scientist to suggest their existence from theoretical considerations —shows this is true in the British science journal *Nature*.

The "father" is the Japanese scientist, Prof. Hideki Yukawa of Osaka University. While the name mesotrons has been given now to the particles of intermediate mass which he postulated, there was considerable feeling that the particles be named "Yukons" in his honor.

In his latest report, with Dr. Shoichi Sakata, Prof. Yukawa shows that observed differences in mass of the mesotrons account for this swiftly-dying particle which has a half-time of the order of a millionth of a second.

The new Japanese report shows that where the mass of the mesotron particle is 100 times that of the electron the radio-active half life is 9.5 millionths and 1.9 millionths of a second for two cases respectively.

When its mass is 200 times that of the electron, however, it disintegrates spontaneously about 200 times as quickly.

A mass of from 100 to 160 times that of the electron appears to agree best with current experiments, the scientists state.

By present theory the disintegration of a mesotron is accompanied by the production of an electron and a neutrino. The former has been observed, the latter has not. It is now believed that much of the penetrating cosmic radiation which is observed on the earth consists of mesotron particles formed high in the stratosphere by the impact of incoming primary cosmic rays.

The experimental discovery of mesotrons came about through cosmic ray investigations. Virtually simultaneously Drs. Carl D. Anderson and Seth H. Neddermeyer of California Institute of Technology and Drs. J. C. Street and E. C. Stevenson of Harvard University reported the discovery late in 1936 and early in 1937.

*Science News Letter, June 10, 1939*

ARCHAEOLOGY

# Tomb Rich in Copper Saws May Be of Doctor-Pharaoh

EXPLORING a tomb at Sakkara containing boxes packed with copper saws and other tools, Egyptian archaeologists believe they may have discovered the resting place of Egypt's second pharaoh, King Zer, noted for his interest in medical lore.

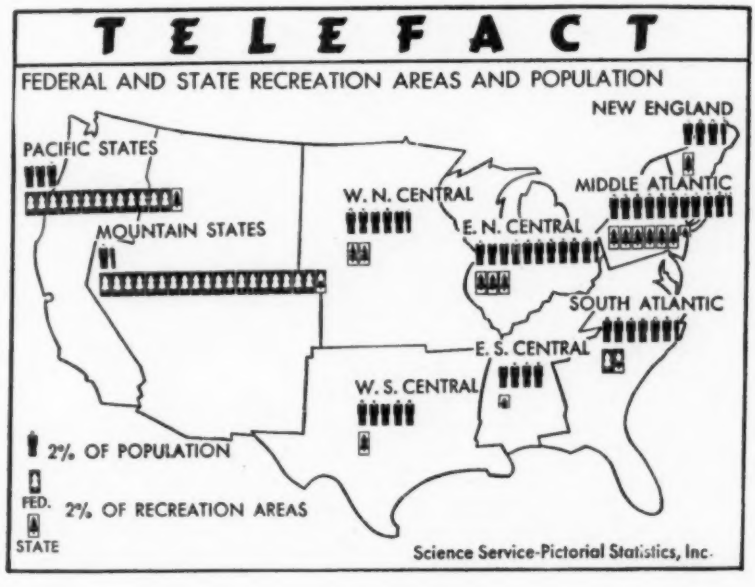
When entered, the tomb was in badly wrecked state, due to robbers who long ago plundered and burned the place. The burial chamber suffered most, only traces of the wood and copper sarcophagus being left by the fire. The falling roof, however, served to extinguish the fire and protect piled boxes in another room. These boxes contain 35 copper daggers with wooden handles, hundreds of copper needles, 79 copper chisels, copper saws a foot long, copper bodkins, 68 copper vessels, 47 copper hoes, and other valued objects.

Whether any of the tools interested King Zer surgically may never be known, but the pharaoh was famous for his anatomical writings, more than 5,000 years ago. His wife, Queen Shesh, is said to have contributed a hair-restorer prescription in Egypt's famous Ebers medical papyrus.

The tomb is linked with this pharaoh by finding stacks of wine jars, on some of which the name Zer can be deciphered. No other name occurs in the tomb. A tomb at Abydos is also linked with this pharaoh, but it was not unusual for Egypt's kings to plan several tombs.

*Science News Letter, June 10, 1939*

The Greenland Colony established by Eric the Red in 986 was a republic for 271 years.



PHYSICS

## Mosquito's Stinger Weighs .0000006 Ounce

IT's the little things which count in life, and just how little they are has been shown by the work of Dr. Harry F. Miller, microscopy specialist of General Electric's Pittsfield, Mass., laboratory.

That bothersome proboscis (stinger to you) of the troublesome mosquito weighs only .000018 of a gram or .0000006 of an ounce. The misplaced comma or period your English teacher might raise the dickens about weighs all of .000002 of a gram in the case of the period, and .000005 gram for the comma. An exclamation mark weighs .000008 gram. These punctuation marks weigh, in ounces, .0000001, .0000002 and .0000003 ounce respectively.

An extremely delicate microchemical balance was used for Dr. Miller's computations.

*Science News Letter, June 10, 1939*

PSYCHOLOGY—SOCIOLOGY

## "Youth" and "Age" May Be Future Political Parties

"YOUTH" and "Age" may be the main political parties of the world of tomorrow.

This prophecy is based on the thinking of economists and population experts concerning what will happen as a result of declining birth rates and a total population no longer growing lustily in numbers.

Both parties may be "radical." What the "age" group may be like, we have an inkling in the recent Townsendite and "Ham and Eggs" movements that made themselves heard on the subject of pensions for the aged. Despite the fact that persons past middle-age are traditionally conservative, age movements may be quite otherwise and may promote very radical schemes in their own interest.

A falling birth rate may be expected, combined with lengthened lives, to add enormously to the potential recruits for the "Age" party.

Youth will demand its party, too. That it will be a fiery radical party, perhaps a reckless and very dangerous one, is surmised from the world's experience with youth movements.

The economic battle between the young and the old shows no sign of lessening. Older men in jobs will fight to keep them. Social Security has not removed as many older people from employment as some hoped. In fact, the prejudice against hiring men over 40 appears to be lessened now that such older men are not likely to become a burden on the conscience or pension roll of industry.

Young people, it is likely, will be kept out of jobs as long as possible by requiring more and more academic training for employment and by pushing up age limits through anti-child labor legislation.

Economic dependency, postponed marriage, competition for jobs, diminishing opportunities for promotion, will surely sharpen the resentment that youth will feel toward age.

Elections in the world of tomorrow should be exciting.

*Science News Letter, June 10, 1939*

ENGINEERING

## Three Pounds of Rubber, Seven Pounds of Steel

DEVELOPMENT of a new type of automobile spring which uses three pounds of rubber and seven pounds of steel in place of the all-steel construction was announced by the B. F. Goodrich Company of Akron, O. The new spring, it was said, requires no lubrication and reduces rattles and squeaks.

It has been installed in the Goodrich exhibit at the New York World's Fair by A. S. Krotz, development engineer.

Rubber springs have been invented and patented many times, but none has ever come into general use. The new Goodrich spring gets around the difficulties of most of its kindred predecessors through the fact that the rubber is under compression and twisting or torsion pressure instead of being under stretch or tension. When under tension, cracks develop in the surface of the rubber and it soon deteriorates.

The rubber surrounds a central steel shaft and is in turn surrounded by a pair of hemispherical steel shells. By making the rubber layer a little larger in diameter than the inside diameter of the steel shells before they are fastened together, the rubber is put under pressure. High pressures are applied during the curing process to bond the rubber and metal firmly. The spring is stressed in torsion by anchoring either shell or shaft to chassis and rotating the other member.

The entire arrangement takes advantage of one of rubber's most marked and most desirable characteristics, its ability to absorb and damp vibration. This has not previously been done in the springs in widest use in automobiles.

*Science News Letter, June 10, 1939*

# IN SCIENCE

INVENTION

## Patents Covering Hosiery From Nylon Granted

FOUR patents covering stockings and other knitted fabrics made from the new synthetic silk, nylon, and indicating that their appearance on the market is not far off, were granted by the U. S. Patent Office to E. I. du Pont de Nemours and Company scientists.

Durable hosiery which is virtually wrinkle-proof, but which may yet be creased under special conditions under control of the manufacturer, and which dries extremely rapidly after laundering are claimed in the group of patents which cover processing treatments.

"Nylon is little sensitive to water spotting," the company declared in a simultaneous announcement. "Nylon fibers are characterized by high tensile strength, high resistance to moisture and extraordinary opposition to all ordinary solvents." Stockings made from it can be washed repeatedly with little effect on the fiber.

One of the patents covers the use of sodium sulfite in small amounts to speed setting of nylon fabrics by steam or hot water. Such setting of the fabric enables it to retain crimps and creases, and improves the material's elastic recovery. The setting is permanent, laundering not affecting the smoothness or original shape.

"Pre-boarding" to give nylon stockings this set shape and smooth appearance is covered in a second one of the four patents. Much more severe conditions of moisture and heat than originally used in the setting are required to destroy or alter the set. Hence, its permanence.

Two nylon-making plants are under construction, one at Seaford, Del., for textiles, and the other at Belle, W. Va., for a variety of other products that can be made from nylon. Some of them have already made their appearance commercially in the form of toothbrush bristles, sewing thread, fishing lines and fishing leaders. Nylon is made from coal, air and water, and is the first synthetic fiber not derived from an organic base.

*Science News Letter, June 10, 1939*

# NCE FIELDS

MEDICINE

## Little Known Disease Identified At Cornell

MEET "acute interstitial pneumonitis," a new disease entity.

Eighty-six students at Cornell University have entertained the disease in recent months. No influenza epidemic was present but one by one these students had an acute infection of the respiratory tract that, under X-ray examination, somewhat resembled pneumonia.

Four doctors at Cornell University Infirmary report the new disease entity (*Journal, American Medical Association,* May 10). Every month since the infirmary was opened in October, 1937, there have been cases of pneumonitis.

These doctors believe that this disease is more infectious than pneumonia and they hospitalize and isolate all patients, permitting no visitors. They give several reasons why the disease is not simply atypical pneumococcic pneumonia.

They believe the disease, while new in their area, is probably identical with the "acute influenza pneumonitis," described by Major Albert Bowen as occurring in Hawaii from 1931 to 1934 and with the "acute pneumonitis probably caused by a filtrable virus," described by Dr. Hobart A. Reimann as occurring in Philadelphia in 1938.

*Science News Letter, June 10, 1939*

ANTHROPOLOGY

## "What Is an Indian?" Can't Be Summed Briefly

NOW THAT Americans are taking to Indian jewelry and rugs and other craft work, and now that Indian villages are part of every world's fair, it would seem that the red man should be better understood by the public.

It is undoubtedly true that America's aborigines are better understood. School children, who used to be brought up on Hiawatha, and got additional ideas from observing circus and Wild West show Indians, are now taught as a rule something about Navajos, Pueblos, and some of the other tribes with distinctive manner of living.

But even today, if you ask any one what he considers a typical Indian, you usually find that Indians are people who live in tepees and wear blankets and war bonnets. Yet the majority of prehistoric Indians, in the United States area at least, were settled farmers, not roving hunters. And the biggest tribe today are the sheep-herding Navajos who do not resemble plains or forest tribes either in their dress or in the appearance of their homes.

The explorers, from Columbus on, never grasped the idea that aboriginal America was peopled by all grades of humanity from the simple savage up to the scholar. They looked at the primitive groups and debated whether they must regard these curious objects as human beings with souls. In Mexico, they were awed by luxury and magnificence of Aztec rulers, and they were surprised that natives could read and write. But they never realized that Indian picture books contained proof of astronomical and mathematical learning in some ways beyond that of Europe's wise men.

In short, the native life of America was not seen or appreciated as the varied expression of a race which accomplished remarkable things in favorable circumstances, and was retarded in other regions and conditions.

There was no typical Indian then, and even though the Indian tribes of today are less widely varied in their state of progress there is no typical Indian, really, today.

*Science News Letter, June 10, 1939*

ANTHROPOLOGY

## Heads Grow Fastest Between Ages of Two and Four

CHILDREN'S heads grow most rapidly in length between the ages of two and five, in breadth between two and four. Length increase then drops off sharply until seven, and there are further pulsations of growth until about 13. Then boys' heads take on a new spurt, but girls' heads slow down in growth.

These are among the results of measurements taken year after year on the heads of more than 250 children from the time they were two years old until they were sixteen or seventeen, reported by Dr. Marcus S. Goldstein of New York University (*Human Biology,* June).

Girls who reached physiological maturity earliest had heads definitely larger than their later-maturing companions, Dr. Goldstein found.

*Science News Letter, June 10, 1939*

AERONAUTICS

## Case School Gets Grant To Study Low-Drag Wing

THE Case School of Applied Science in Cleveland has received a grant of $1800 from the National Advisory Committee for Aeronautics to finance a study of a low-drag wing by Prof. John R. Weske and Karl Scheucher, a senior at the school. Importance of the study lies in the fact that a five per cent. drag reduction, Dr. Weske said, may in some cases make it possible to double the plane's payload by reducing the amount of fuel that must be carried.

*Science News Letter, June 10, 1939*

AERONAUTICS

## Only Two Ships Beat Once-A-Week Airmail

ONCE-A-WEEK airmail service to Europe, now available following Pan American Airways' inaugural flight, beats every other mail overseas except letters mailed Monday and Tuesday from the New York area or earlier from western points, and marked for the Queen Mary and Normandie, a survey of schedules showed. In the exceptional case, the race is a tie.

When direct service to London is started this month, after ice clears from Botwood harbor in Newfoundland, or when twice-a-week flights commence, also expected shortly, steamship mail will under no conditions be able to reach Europe before or at the same time as airmail.

Because airmail letters for Europe may lie in New York for several days before a flight, it is still possible on two business days a week to write and mail a letter that will reach Europe just as quickly via the two foreign flag giants. The Queen Mary and Normandie sail from New York on Wednesdays, mail on board being delivered in Europe's capitals the next Tuesday morning, even if marked "express" or special delivery. Length of time in advance of the sailing that must be allowed for letters to reach the steamers depends on distance and whether the mail is sent first class or via air. Mail sent to Europe via Pan American's Marseilles service is also delivered in Europe's leading cities on Tuesday.

Ship mail that misses these two fastest steamers cannot reach Europe before or even at the same time as Pan American's present service. Airmail to Europe costs thirty cents a half ounce from any point in the United States.

*Science News Letter, June 10, 1939*

PUBLIC HEALTH

# Prescribed Vacations

## You May Get Ten Days at the Seashore or a Month In the Mountains—Just What You Need to Restore Health

By JANE STAFFORD

RX: 10 days at the shore—to be taken as directed.

Here's a new idea for that summer vacation you are planning: Have it made to order for you, according to your doctor's prescription.

That is only a sample prescription, however. *You* may get one ordering three weeks on a mountaintop. The important thing is that if you consult your physician about it, you will get a vacation tailored to your own individual requirements. The result will be good for your health and your spirits too.

The suggestion for made-to-order vacations comes from Dr. Charles I. Singer, of Long Beach, N. Y. In a recent *Journal of the American Medical Association,* he pointed out the benefits to be gained from such vacations.

More than 35,000,000 Americans take part every year in what Dr. Singer calls vacational migrations. They spend on these migrations the "incredible but carefully estimated sum of $5,000,000,000 yearly," he says.

You know what part of that five-billion-dollar vacation bill you pay. Do you get your money's worth in health and in replenishment of physical and mental resources? Or do you come home tired out, blistered from sunburn, and feeling let-down and disappointed by the vacation you had looked forward to for months?

### Governed By Whim

America's vacational migrations, Dr. Singer says, lack "a conscious, well-recognized purpose and are governed mostly by vogues, whims and fads born out of hearsay evidence.

"The average American," he points out, "is not chiefly concerned with improving his state of health during his vacation. His conscious motives are wanderlust and the craving for a good time. He fulfills his desires in this respect but neglects his chance to improve his physical condition at the same time.

"It is different with the European . . . It is traditional with the European to take his vacation regularly and to consider it a very important constructive period of life. Whether he feels ill or not, he consults his physician about the site of his vacation . . . .

"The American public does not know that for the healthy individual a medical vacational guidance is advisable and that in the sick it is imperative. People should be taught to know this."

### Not Your Fault

It is probably not entirely your fault if you do not get the greatest health benefits from your vacation. Dr. Singer goes on to chide American physicians a bit for not giving more consideration to vacation prescriptions. For one thing, the basic facts about the effects of climate on various types of individuals and in various ailments are not yet established. American health resorts have not been developed as they might have been. One thing seems sure, however. There is no need to cross the ocean to get the health benefits of either spas or climate.

"Nature did not bestow all its natural resources on Europe," Dr. Singer declares. "On the contrary, Europe has no Florida, no California, Nevada or Colorado and nothing like Yellowstone Park, with its mineral thermal springs and mud volcanoes."

Yellowstone Park, it should be noted, will for many reasons remain a vacation spot minus health resort features, but there are plenty of other places in the United States where you can drink the medicinal waters and take hot spring and mud baths, if your health requires them. Arkansas and Virginia, for example, have their hot springs, and New York's Saratoga has mineral waters as well as horse races.

### Climate a Factor

Change of climate is the instinctive factor that induces 35,000,000 Americans to spend five billion dollars on annual vacation migrations, Dr. Singer declares. That being the case, it is interesting to consider exactly what effect climate or change of climate has on the body and thus on the health.

Broadly, climate can be divided into two groups, sedative and stimulating. The sedative climate, of course, is one in which the weather does not change much. Temperature, barometric pres-

*NOT A REST*

***Piling the family into the car and driving across the country in traffic like this is not likely to give you an "emotional armistice" which is one of the health benefits you can get from a vacation if it is medically planned and directed.***

*MOUNTAIN SOLITUDE*

***May be what the doctor orders for you, but your neighbor may get surf bathing or some other different climatic prescription for his vacation. This photograph was made in Yellowstone National Park by Jack Haynes.***

sure and humidity scarcely vary from day to day or even from month to month. There are almost no winds or storms. The stimulating climate is just the reverse and is characterized by sudden and wide changes in atmospheric conditions. Northern climates are generally considered stimulating and southern climates enjoy the reputation of being sedative.

These factors are relative, however, and what may be a stimulating climate for you, if that is what you need, may be rather sedative for another person. Dr. Singer illustrates this by three types of persons: the New England fisherman, the New York business man and the Florida farmer.

### Each to His Own

"Each one of these is healthy in his own environment. The late fall climate of North Carolina will be stimulating to the Florida farmer and sedative to the New York business man. The New York business man will find the fall climate of Maine stimulating, while the New England fisherman, accustomed to drenching waves and strong winds, will find it mild."

Change to a stimulating climate provides a "challenge" whereas the change to a sedative climate provides an "escape."

Delicate children, the feeble aged person, patients with such debilitating ailments as rheumatic heart disease, chronic nephritis and rheumatoid arthritis will probably benefit from a sedative climate which provides an escape from the hardships of winter.

### Improves Metabolism

The challenge of a stimulating climate is in order, it seems, for the person whose body is not doing the most efficient job of blood-building or of breathing or of mineral utilization or of that kind of energy interchange called metabolism.

Discussing the effect of a stimulating climate on the body, Dr. Singer says that exposure to such a climate starts a slight disturbance in the system with marked and typical changes in the blood cell count and in the chemistry of the blood. At the same time parallel changes occur in metabolism. The body immediately tries to correct these changes by mobilizing its interrelated forces of defense—chemical, blood-building, glandular and neurovascular.

"By successive exposures," he states, "the amplitude of these climatic microdamages decrease as the acclimatization progresses. Parallel with the process of acclimatization, preexisting chronic disorders may be overcome with the same systemic effort."

Just as with other medical treatments, the size of the dose of climate is important as well as its quality. There is such a thing, Dr. Singer points out, as "an ineffective underexposure to climate and a harmful overexposure." The best dose, it appears, has to be prescribed in accordance with the season and climate selected; the condition, constitution and age of the individual; and the nature and stage of chronic disorder, if the climatic change is being prescribed for someone who is not well.

### Special Treatments

Climatic treatment takes three main forms. First, there is plain change of climate. Then there is selective utilization of climatic factors. This takes in such things as sunbaths, bathing in salt or other kinds of water and getting out in the open air for long periods. Finally, Dr. Singer points out, climate can be used as a background for special types of treatment such as mudbaths for arthritis, carbon dioxide baths for heart and blood vessel disorders and inhalation treatment for chronic bronchial disorders.

Whether you are sick or well, you are apt to get into trouble if you plan your own climatic treatment without having your physician's advice. To get the greatest health value from your vacation, you need his advice not only as to the place you select for your vacation but as to how long you should stay there and what activities you should pursue. Maybe you should spend all morning in the saddle, but your neighbor should play nine holes of golf in the morning and rest on the beach all afternoon. Some people make the mistake of overeating while on vacation and many fail to eat a balanced diet when away from home with its carefully plan-

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**WILLIAM PATON**

**Shell** **Wyoming**

ned meals. Still others, perhaps, need to use the vacation to start them on proper dietary habits. Other pitfalls of undirected vacations mentioned by Dr. Singer are faulty habits of sleeping, insufficient utilization of climatic factors and overexposure to climatic stimulation with consequent reactions of an unpleasant and harmful nature.

One of the benefits you can get from a medically planned vacation, especially if you have been or still are ill, is what Dr. Singer calls an "emotional armistice." This and the shedding of faulty living habits are, in his opinion, just as necessary for the future welfare of the chronic sick as the baths, medicinal waters and other features of "the cure" at a health resort.

### Rest for Nerves

Perhaps healthy people do not have so many phobias and idiosyncrasies as sick people are apt to develop, but an emotional armistice sounds like a good prescription for many a person who, though not sick in bed, is tired out or keyed up to such a pitch that he does not appreciate how much he needs rest. When you reach the point of flying into a rage or bursting into tears over trifles, you probably know without being told by the doctor that you need to get away and rest. But if you pile the family into the car and drive to the shore for a week, or go on a camping trip with four or five other tired friends, you are not likely to get much of an emotional armistice.

The health resort, with its peaceful atmosphere and medical supervision, provides an ideal setting for an emotional armistice. Whether you need baths and massage and other treatment or not, you will get the daily nap, the long night's rest, the regular, well-planned meals and the proper amount of exercise and fresh air that your body and mind require and which you are not likely to get for yourself on the medically unplanned vacation.

### Don't Ask the Neighbor

If medical supervision is important for the well person's vacation, it is doubly important for those who are not well. You often hear a sick friend say his doctor told him change of climate might be good for him, so he is going to Arizona, or the north woods or some seashore resort "because it did John so much good." Such a person is like those uninformed people who take whatever medicine John said helped his cough or his stomach trouble. Your cough or stomach trouble may call for an entirely different medicine and your health may require a different climatic change than the one that helped John.

"The chronic sick of America," Dr. Singer says, "consist of the real forgotten people."

These hundreds of thousands, who cannot find help in surgery or in medical treatment, go away for their health, starting their vacation with insufficient medical advice or none at all. If they can afford to stay at a medically supervised health resort they will receive medical and health care. Unfortunately most of them cannot afford this. But if they go to a resort which lacks a well-organized medical set-up, they will find the general practitioner too busy during the vacation season to be of much help. He has not enough time to devote to the acutely sick who may need him, much less to study the effects of his climate so as to give competent advice about it. So the chronic sick, as Dr. Singer puts it, "fall prey to quacks, charlatans and cultists who follow them like vultures."

The situation is quite different in European health resorts. There is, in the first place, scientific cooperation between the physician at the health resort or spa and the patient's own doctor. About three-fourths of the patients are sent to the resort or spa by their own physician or some medical consultant. Whether they are sent by a physician or not, in most of the resorts they are all required to have a medical examination by the physician at the resort, to give him a full history of their ailment, and to remain under medical supervision while at the resort. The resort physician keeps in touch with the patient's own doctor and sends him reports of the patient's progress. Accommodations are generally available to suit varying pocketbooks. In France the government, railroads, utilities and charitable organizations cooperate in maintaining several thousand sanatorium beds, in spas and health resorts for both child and adult chronic sick.

Getting back to American vacational migrations, the most popular points for the 35,000,000 vacationists, healthy or sick, are: first, seashores and lakeshores; second, mountains; and third, deserts. Only about a third of the annual vacationists stay longer than ten days within a state. Those who stay less than ten days within a state make up about 65 per cent. of the total number of migrants.

### 20% Winter Vacations

Another breakdown which Dr. Singer made of the vacational migration figures shows that the greater portion of them, as you might expect, take place in summer. This accounts for about 70 per cent. About 20 per cent. take place in winter, and the remaining 10 per cent. are in spring and fall.

Inhabitants of all states take part in the vacational migrations, but midwesterners and those from the northeast predominate. Typical vacation states—these are the states where vacationists go, but not necessarily where they should go for their best health buys in vacations—are (1) New England, New York and New Jersey; (2) Florida and the Gulf states; (3) California; (4) the Great Lakes states; and (5) the desert states—New Mexico, Colorado and Arizona.

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*Science News Letter, June 10, 1939*

In replacing trees lost in the New England hurricane, a botanist advises that New England towns have a fine opportunity to make the streets interesting to a public which is increasingly "plant conscious."

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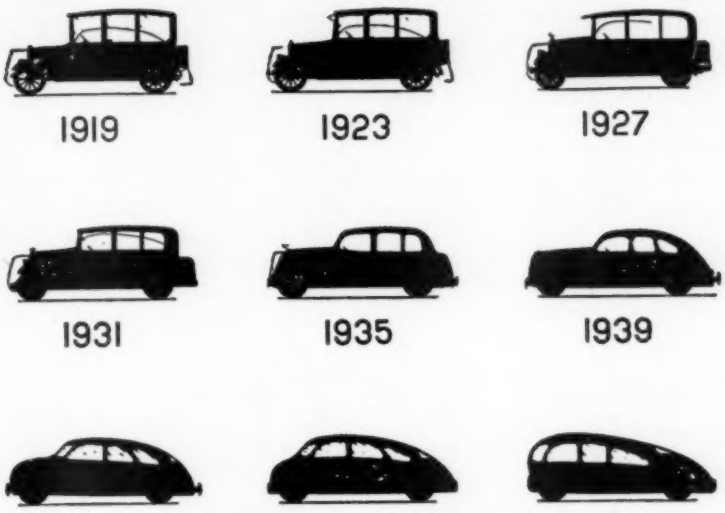


*EVOLUTION OF THE AUTO*

***Will it develop along line shown here? Engineer Edwin L. Allen of the Standard Products Company thinks so, and told the World Automotive Engineering Congress not only of the streamlining to come, but also of such conveniences as movable seats, a roof fitted with transparent plastic panels that let in ultra violet light, and air conditioning (See SNL, June 3). The chief change required to give autos the shape shown in the last drawing is putting the engine in the rear.***

PHYSIOLOGY

# May Fight Tooth Decay Through Drinking Water

## "Startling Finding" Reveals Possibility That Fluorine or Other Chemical May Prevent Caries

DRINKING water may be the weapon of tomorrow for fighting and conquering tooth decay or dental caries. This possibility looms as a result of a "startling finding" reported by Dr. H. Trendley Dean and associates of the U. S. Public Health Service.

The amount of tooth decay among school children is not the same in one town after another, as might be expected. There was double and treble as much found among children in two Illinois cities, Macomb and Quincy, for example, as in the nearby cities of Galesburg and Monmouth. The difference, it appears, is related to differences in the water supplies, and particularly to differences in the amounts of fluorine in the drinking water.

Fluorine in drinking water is the cause of the ugly tooth condition of mottled enamel. But in Galesburg and Monmouth, where the water contains 1.8 and 1.7 parts per million of fluorine, the threshold of safety for mottled enamel, the children's teeth showed much less decay than in the towns of Macomb and Quincy where the drinking water contained only 0.2 parts per million of fluorine.

Dr. Dean is not yet ready to advise adding fluorine to drinking water to prevent tooth decay. Before recommending such a step he wants more evidence to show that it is the fluorine and not some other constituent of the drinking water that makes the difference in the amount of dental decay. But he called the latest findings "startling" and said that they show the drinking water may be "deucedly important" in connection with the tooth decay problem.

Dental caries or tooth decay is second only to the common cold as the commonest of mankind's ills, affecting at least 19 out of 20 persons.

*Science News Letter, June 10, 1939*

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A polar bear shot in Quebec Province last autumn must have traveled nearly 400 miles from James Bay through dense forest and along rivers.

PSYCHOLOGY—SOCIOLOGY

# Marriage Courses Neglect Practical Topics Desired

BOWING to the demands of practical-minded students, more and more conservative colleges are adding to the curriculum courses of preparation for marriage.

This is applauded by social scientists who look upon the failure of any marriage as a concern of society as well as the individual husbands and wives.

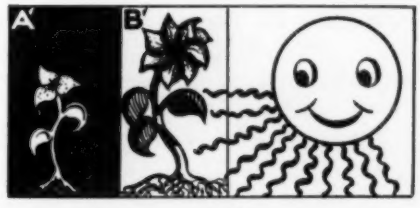
But the content of the courses still falls far short of what the students want and society needs, in the opinion of an expert in this field, Dr. Paul Popenoe, director of the Institute of Family Relations in Los Angeles.

Too much emphasis is placed, he thinks, on divorce, which leads all other topics in the frequency with which it is discussed in marriage courses.

"Divorce," declares Dr. Popenoe, writing in the *Journal of Social Hygiene*, "is not an evil; it is merely the symptom of the real evil, which is unhappy marriage."

Altogether too much time is devoted to philosophizing and reviewing the institution of marriage as it existed in earlier times and remote places. Eugenic aspects of marriage are discussed, and legal aspects and religion in the home.

Contrast such generalized topics with the practical questions asked by boys in Haverford College for Frank D. Watson

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to indicate what they wanted from such a course. They concern:

1. The problems that parenthood brings. (Probably, it is suggested, these boys are aware of difficulties in their relations to their own parents.)
2. The problems that sex presents before marriage becomes economically possible.
3. The wise choice of a mate.
4. The husband-wife relationship and the individual adjustment necessary in marriage if it is to be a happy one.
5. The problem of family limitation or birth control.
6. The problem of the break-down of family life and divorce.
7. Possible variations in the form of marriage, such as the companionate marriage. The latter topic, of lively interest among high school students, has only minor concern for the more practical college boys.

*Science News Letter, June 10, 1939*

PUBLIC HEALTH

# No Typhoid List Topped By Bridgeport, Conn.

NEW low records for deaths from typhoid fever in the large cities of the United States are reported by the American Medical Association for the year 1938.

The *Journal of the A. M. A.* (May 13) publishes its honor roll of cities with no typhoid deaths.

First place on the list goes to Bridgeport, Conn., with no fatality from typhoid fever in five years.

Fort Wayne, Ind., is runner-up, with no typhoid deaths for four years.

South Bend, Ind., and Utica, N. Y., have had none in three years.

Canton, Ohio; Fall River and Lynn, Mass.; Milwaukee, Wis.; New Bedford, Conn.; Reading, Pa.; Seattle and Tacoma, Wash., and Wichita, Kan., have had no deaths from the disease in two years.

Other honor roll cities with no typhoid deaths in 1938 are: Buffalo, N. Y.; Cambridge and Lowell, Mass.; Elizabeth, N. J.; Erie and Scranton, Pa.; Grand Rapids, Mich.; Kansas City, Kan.; Minneapolis, Minn.; Omaha, Neb.; Peoria, Ill.; Portland, Ore.; Providence, R. I.; Salt Lake City, Utah; San Diego, Calif., and Youngstown, Ohio.

Seven other cities are placed in first rank rather than on the honor roll because they have been charged with deaths among non-residents. These are: Toledo, Ohio; Hartford, Conn.; Syracuse, N. Y.; Worcester, Mass.; Springfield, Mass.; Evansville, Ind., and Camden, N. J.

No outbreak of epidemic proportions was recorded during 1938. Routine vaccination of the population is not practiced except under flood conditions. However, in progressive communities vaccinations are urged for contacts to cases and for persons who travel widely in insanitary countries.

In this annual survey, the A. M. A. notes a trend in some places, particularly in the southern states, to encourage the inoculation of food handlers.

*Science News Letter, June 10, 1939*

BOTANY

## Iodine Is Apparently Necessary For Plants

IODINE may prove to be as necessary for plant health and growth as it is for that of humans, Prof. W. L. Powers of Oregon State College suggests, (*Science,* May 12) in the preliminary report of ten years of experiments with plant species ranging all the way from spinach to bacteria.

The plants were grown in soil-less cultures, with nutrient solutions constantly flowing around their roots. The amounts of iodine found necessary were very minute: one part of iodine in from two to four million parts of water was sufficient.

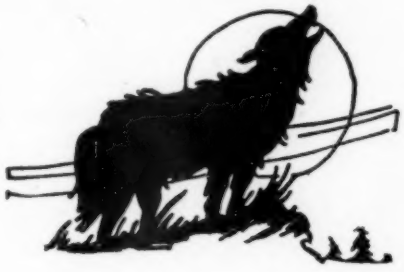
Iodine seems to be in some way necessary for chlorophyll formation, and reaches particularly high concentration in spinach and head lettuce. Yet lower plants without chlorophyll, including yeasts and the nitrogen-fixing root-nodule bacteria, also throve better on iodine-containing media.

Prof. Powers points out that one of the values in using seaweed as a fertilizer, a common practice along all seacoasts, may be in the iodine thereby added to the soil. He suggests also that putting potassium iodide into irrigation water may eventually become standard horticultural procedure.

*Science News Letter, June 10, 1939*

ETHNOLOGY

## NATURE RAMBLINGS
*by Frank Thone*



### Applied Zoology

KEEN observation and accurate knowledge of the ways of animals may be only an intellectual pastime in civilized lands where life is easy and food comes out of a slot machine or a can, but to the Eskimo such knowledge is the price of survival itself.

How ingeniously his wisdom about animals is used by this man of the Far North, "who can make the most out of nothing," is told in *Natural History* (May), by its editor, Dr. Edward Weyer. Dr. Weyer spent several years studying the Eskimo, observing them in Alaska and North Greenland.

Wolves are a pet hate of the Eskimo. They are extremely difficult to shoot or trap, as any white hunter can tell you. Yet Okluk can make them kill themselves. One trick is to smear the blade of a sharp knife with blood, then bury the handle firmly in the snow, leaving only the blade sticking upright. The wolf, scenting blood, comes and licks eagerly. So avid is he that he does not notice he has cut his tongue, and that it is now his own blood he is licking. In the end he bleeds to death.

Another trick on the wolf is to take a slender, flexible piece of whalebone, like an old-fashioned corset stay. This is sharpened on both ends, bent into a spring-like loop tied with sinew, and embedded in a lump of fat. This is put outside to freeze, then thrown where the wolf will find it. The ravenous beast "wolfs it down" at a gulp, the digestive juices loosen the sinew, and the sharpened ends of the whalebone spring to inflict fatal internal wounds.

Seals are the Eskimo's prime source of both food and clothing. They are exceedingly difficult to stalk, yet Okluk has learned to imitate their movements so well that if necessary he can creep right up alongside of them as they bask at the edge of open water. He even imitates the scratching sounds they make as they flipper along. Then when close enough, a quick grip on a flipper with one hand, a knife thrust home with the other—and Okluk has his seal.

*Science News Letter, June 10, 1939*

PSYCHOLOGY

## "Wandering IQ" Claim Is Disputed by Psychologist

HEATED discussion among scientists over the so-called "Wandering IQ" will concern parents who naturally want their children's intelligence quotient (IQ) to do any wandering in the upward direction.

The IQ, according to one school of thought, is no fixed thing determined before birth by the child's selection of ancestors. Environment, say these psychologists, can move the IQ up or down. Children taken from stupid parents and adopted by intellectual foster parents will grow in mental stature so that the quotient, which is mental age divided by chronological age, actually increases.

Sending your child to a good nursery school while he is still very young, these investigators contend, may change him from an average youngster to a genius.

"Don't grasp at the bubble," is the warning to be taken from a criticism of such claims appearing in the *Journal of Psychology*. "Statistical incompetence under the influence of wishful thinking," is the verdict of Dr. Benjamin R. Simpson, educational psychologist of Western Reserve University, who holds faulty statistical methods responsible for the evidence obtained at the University of Iowa for the "wandering IQ."

The conclusions, he indicates, are based on average scores for the whole group rather than on a comparison of Johnny at the age of two with Johnny when he is ten. The dropping out of children at the lower end of the IQ scale would influence results greatly, and this influence was not taken into account, he charges.

Meanwhile, in a new study at the Rhode Island College of Education, Dr. Grace E. Bird has made a comparison of IQ scores of nursery school children with later scores of the same individual children.

The IQ's she found, were sufficiently constant to indicate that the test is still valuable when administered under stable conditions. But some individuals go up or down in IQ apparently because of their tendency to variability and quite regardless of either change of environment or unevenness of maturation. One child gained as much as 25 points. But the average gain was only 5 points, the average loss, the same.

*Science News Letter, June 10, 1939*

## ●RADIO

**Prof. Samuel W. Fernberger, psychologist of the University of Pennsylvania, will be the guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Monday, June 19, 5:45 EDST, 4:45 EST, 3:45 CST, 2:45 MST, 1:45 PST. Listen in on your local station. Listen in each Monday.**

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# •First Glances at New Books

**Reference**

A PICTURE DICTIONARY FOR CHILDREN—Garnette Watters and S. A. Courtis—*Grosset & Dunlap,* 478 p., $1. An excellent idea for home education, and for school use, too, is this dictionary for children of first to third grade ages. The two educators who planned it have chosen 4,832 words and their variants to present in large print and script. Each word is illustrated with a sentence and usually a picture.

*Science News Letter, June 10, 1939*

**Medicine**

MANUAL OF TOXICOLOGY—Forrest R. Davison—*Harper,* 241 p., $2.50. A concise and practical manual for medical students and practicing physicians.

*Science News Letter, June 10, 1939*

**Anthropology**

DEZBA, Woman of the Desert—Gladys A. Reichard—*Augustin,* 161 p., $3. An anthropologist translates Navajo culture into the narrative terms of a family's experiences. One son comes under influences of white civilization and education, and meets the problem of fitting together old ways and new.

*Science News Letter, June 10, 1939*

**Geography**

BEAUTIFUL HAWAII—J. Walker McSpadden—*Crowell,* 220 p., $2.50. An informal guidebook, pleasantly discussing what to see and why and how, including some of the less-frequented sights of the islands.

*Science News Letter, June 10, 1939*

**Anthropology**

INDIAN OASIS—Janette Woodruff as told to Cecil Dryden—*Caxton,* 325 p., $3. A really delightful book of reminiscence awaits the reader, behind a vague-sounding title. Open at any page, and you find your attention caught by amusing or pathetic, but always human, adventures of a matron in Indian boarding schools of the West.

*Science News Letter, June 10, 1939*

**Physics**

FIRST REPORT ON VISCOSITY AND PLASTICITY, 2d ed.—Comm. for the Study of Viscosity of the Academy of Sciences at Amsterdam—*Nordemann,* 273 p., $7.

*Science News Letter, June 10, 1939*

**Chemistry**

PROTECTIVE COATINGS FOR METALS—R. M. Burns and A. E. Schuh—*Reinhold,* 407 p., $6.50. This is the newest addition to the American Chemical Society's monograph series, prepared by scientists of two great industrial research laboratories. The usefulness of various plating materials and paint are the two main topics of the book.

*Science News Letter, June 10, 1939*

**Metallurgy**

THE TECHNICAL ANALYSIS OF ORES AND METALLURGICAL PRODUCTS—Franklin G. Hills—*Chemical Pub. Co.,* 250 p., $3. Compact book of value not only to the metallurgical chemist but to the engineers who may have occasion to make ore analysis. Each chapter covers the analysis of some different chemical element in ore.

*Science News Letter, June 10, 1939*

**Mathematics**

COMMERCIAL ALGEBRA—Isaiah Leslie Miller and Clarence H. Richardson—*Van Nostrand,* 165 p., $1.80. Algebra for industry might well be the secondary title of this book, which is designed for the fourth year of high school or the first year of college. It presupposes at least one year's study of algebra. Its problems would merit attention by other technical writers in this subject because of their practical immediately-apparent interest.

*Science News Letter, June 10, 1939*

**Sport**

THE NEW ARCHERY—Paul H. Gordon—*Appleton-Century,* 423 p., $3.50. This book might well have been titled The Complete Archer, Bowyer and Fletcher, for it not only gives the minutest directions for the sport of archery itself but tells how to make one's own bows and arrows—which is the surest way to an understanding and appreciation of them.

*Science News Letter, June 10, 1939*

**Physics**

MODERN MAGNETISM—L. F. Bates—*Cambridge (Macmillan),* 340 p., $4.50. An advanced text on magnetism written with typical British thoroughness. It places the emphasis on the experimental viewpoint rather than the customary theoretical aspects.

*Science News Letter, June 10, 1939*

**Engineering**

ENGINEERING OPPORTUNITIES—R. W. Clyne, ed.—*Appleton-Century,* 397 p., $3. Twenty-six fields of industry are described primarily for young men who are picking out their fields of engineering, but the comments and explanations of the specialists from industry who write the chapters provide a broad summary of modern technology.

*Science News Letter, June 10, 1939*

**Botany**

ORCHIDS OF MICHIGAN—Marjorie T. Bingham—*Cranbrook Institute of Science,* 87 p., illus., cloth $1.50, paper $1. A book for the lover of our native orchids. The identifying key is in non-technical language, and the discussions of the species, in plain English also, include esthetic considerations and possibilities of cultivation as well as botanical and distributional points.

*Science News Letter, June 10, 1939*

**Medicine**

MANUAL OF FRACTURES AND DISLOCATIONS—Barbara Bartlett Stimson—*Lea & Febiger,* 214 p., $2.75. Illustrated handbook for medical students by a member of the staff of the Fracture Service at Columbia-Presbyterian Medical Center.

*Science News Letter, June 10, 1939*

**Medicine**

PRINCIPLES OF HEMATOLOGY—Russell L. Haden—*Lea & Febiger,* 348 p., $4.50. A text which seeks to simplify and clarify, for medical students and practising physicians, the facts they need to know about blood disorders, omitting the rarer disorders which the author believes the average physician should refer to a special student of the blood.

*Science News Letter, June 10, 1939*

**Ornithology**

BIRDS—Gayle Pickwell—*Whittlesey,* 252 p., $3.50. A new book in the series, of which *Weather* and *Deserts* have already been mentioned on this page. This book is quite up to the high mark in photographic illustration set by its two forerunners. The text is good popular ornithology, entertainingly written.

*Science News Letter, June 10, 1939*

**Zoology**

REPTILES AND AMPHIBIANS—Federal Writers' Project—*Whitman,* 253 p., $2.25. The choicest reptile and amphibian photographs were collected from many sources for this book. Text descriptions are brief and popularly written, and include interesting out-of-the way facts in addition to the customary standard zoological information.

*Science News Letter, June 10, 1939*

**Architecture—Horticulture**

GARDEN PLANNING AND BUILDING—H. Stuart Ortloff and Henry B. Raymore—*Whittlesey,* 244 p. $3. Detailed directions and specifications for the laying out and construction of all types of ornamental plantings, well illustrated with ground plans and perspective sketches.

*Science News Letter, June 10, 1939*